

Listing of the Claims

1. (Currently Amended) An IPS-LCD device, comprising:
 - first and second substrates opposing each other;
 - a gate line on the first substrate;
 - a data line perpendicular to the gate line;
 - a thin film transistor at a crossing portion between the gate and data lines;
 - a common line parallel to the gate line;
 - a plurality of common electrodes electrically connected to the common line, wherein the common electrodes are spaced apart from each other and covered by a gate-insulating layer;
 - a plurality of pixel electrodes alternately arranged with the plurality of common electrodes, wherein each pixel electrode is spaced apart from an adjacent common electrode and covered by a passivation layer;
 - a plurality of dielectric protrusions on the plurality of common electrodes and pixel electrodes between the first and second substrates, wherein the dielectric protrusions are disposed along reference lines perpendicular to the plurality of common electrodes and pixel electrodes; and
 - a liquid crystal layer between the first and second substrates, wherein the liquid crystal layer and the dielectric protrusion have different dielectric constants.
2. (Original) The device of claim 1, wherein the dielectric protrusion has a smaller dielectric constant than the liquid crystal layer.
3. (Withdrawn) The device of claim 1, wherein the dielectric protrusion has a larger dielectric constant than the liquid crystal layer.
4. (Original) The device of claim 1, wherein the dielectric protrusion is an organic material.
5. (Original) The device of claim 4, wherein the organic material is selected from a group consisting of photoresist, benzocyclobutene (BCB), and acryl resin.
6. (Withdrawn) The device of claim 1, wherein a first plurality of the dielectric protrusions are disposed over a plurality of pixel electrodes.

7. (Withdrawn) The device of claim 1, wherein a second plurality of the dielectric protrusions are disposed over a plurality of common electrodes.
8. (Withdrawn) The device of claims 6, wherein the plurality of first and second protrusions are formed on the first substrate having the pixel electrodes.
9. (Withdrawn) The device of claims 6, wherein the plurality of first and second protrusions are formed on the second substrate.
10. (Withdrawn) The device of claim 1, wherein the dielectric protrusion is a chevron-shaped dielectric protrusion.
11. (Withdrawn) The device of claim 10, wherein the chevron-shaped dielectric protrusion has a zigzag shape extending along a line perpendicular to the common and pixel electrodes.
12. (Original) The device of claim 1, wherein the pixel electrode is selected from a group consisting of indium tin oxide (ITO) and indium zinc oxide (IZO).
13. (Original) The device of claim 1, wherein the common electrode is selected from a group consisting of chromium (Cr), aluminum (Al), aluminum alloy (Al alloy), molybdenum (Mo), tantalum (Ta), tungsten (W), antimony (Sb), and an alloy thereof.
14. (Withdrawn) The device of claim 1, wherein the common electrode is selected from a group consisting of indium tin oxide (ITO) and indium zinc oxide (IZO).
15. (Withdrawn) The device of claim 1, wherein the liquid crystal layer comprising liquid crystal molecules is a positive liquid crystal having a positive dielectric anisotropy, wherein long axes of liquid crystal molecules are aligned parallel to the common and pixel electrodes in off state.
16. (Original) The device of claim 1, wherein the liquid crystal layer comprising liquid crystal molecules is a negative liquid crystal having a negative dielectric anisotropy, wherein long axes of liquid crystal molecules are aligned perpendicular to the common and pixel electrodes in an off state.
17. (Withdrawn) An in-plane-switching liquid crystal display panel, comprising:

first and second substrates opposing each other;
a gate line on the substrate;
a data line perpendicular to the gate line;
a thin film transistor at a crossing portion between the gate and data lines;
a main common line parallel to the gate line;
first and second auxiliary common lines perpendicular to the main common line, the first and second auxiliary common lines being parallel to and spaced apart from each other;
a plurality of common electrodes electrically connected to the first and second auxiliary common lines, the plurality of common electrodes being spaced apart from each other;
a plurality of pixel electrodes alternately arranged with the plurality of common electrodes, wherein each pixel electrode is spaced apart from an adjacent common electrode;
a plurality of dielectric protrusions between the first and second substrates; and
a liquid crystal layer between the first and second substrates.

18. (Withdrawn) The device of claim 17, wherein the dielectric protrusion has a smaller dielectric constant than the liquid crystal layer.

19. (Withdrawn) The device of claim 17, wherein the dielectric protrusion has a larger dielectric constant than the liquid crystal layer.

20. (Withdrawn) The device of claim 17, wherein the dielectric protrusion is an organic material.

21. (Withdrawn) The device of claim 20, wherein the organic material is selected from a group consisting of photoresist, benzocyclobutene (BCB), and acryl resin.

22. (Withdrawn) The device of claim 17, wherein a first plurality of dielectric protrusions are disposed over a plurality of pixel electrodes.

23. (Withdrawn) The device of claim 17, wherein a second plurality of dielectric protrusions are disposed over a plurality of common electrodes.

24. (Withdrawn) The device of claims 22, wherein the plurality of first and second protrusions are formed on the first substrate having the pixel electrodes.

25. (Withdrawn) The device of claims 22, wherein the plurality of first and second protrusions are formed on the second substrate.
26. (Withdrawn) The device of claim 17, wherein the dielectric protrusion is a chevron-shaped dielectric protrusion.
27. (Withdrawn) The device of claim 26, wherein the chevron-shaped dielectric protrusion has a zigzag shape extending along a line perpendicular to the common and pixel electrodes.
28. (Withdrawn) The device of claim 17, wherein the pixel electrode is selected from a group consisting of indium tin oxide (ITO) and indium zinc oxide (IZO).
29. (Withdrawn) The device of claim 17, wherein the common electrode is selected from a group consisting of chromium (Cr), aluminum (Al), aluminum alloy (Al alloy), molybdenum (Mo), tantalum (Ta), tungsten (W), antimony (Sb), and an alloy thereof.
30. (Withdrawn) The device of claim 17, wherein the common electrode is selected from a group consisting of indium tin oxide (ITO) and indium zinc oxide (IZO).
31. (Withdrawn) The device of claim 17, wherein the liquid crystal layer comprising liquid crystal molecules is a positive liquid crystal having a positive dielectric anisotropy, wherein long axes of liquid crystal molecules are aligned parallel to the common and pixel electrodes in off state.
32. (Withdrawn) The device of claim 17, wherein the liquid crystal layer comprising liquid crystal molecules is a negative liquid crystal having a negative dielectric anisotropy, wherein long axes of liquid crystal molecules are aligned perpendicular to the common and pixel electrodes in an off state.
33. (Withdrawn) The device of claim 7, wherein the plurality of first and second protrusions are formed on the first substrate having the pixel electrode.
34. (Withdrawn) The device of claim 7, wherein the plurality of first and second protrusions are formed on the second substrate.

35. (Withdrawn) The device of claim 23, wherein the plurality of first and second protrusions are formed on the first substrate having the pixel electrode.
36. (Withdrawn) The device of claim 23, wherein the plurality of first and second protrusions are formed on the second substrate.
37. (Previously Presented) The device of claim 1, wherein the dielectric protrusions are disposed on the pixel electrodes and the common electrodes in an alternating pattern.
38. (Withdrawn) The device of claim 1, wherein each pixel electrode includes first, second, third and fourth pixel electrode reference locations and each common electrode includes first, second, third and fourth common electrode reference locations that correspond to the first, second, third and fourth pixel electrode reference locations and wherein the dielectric protrusions are disposed on the pixel electrodes at first and third pixel electrode reference locations and on the common electrodes on second and fourth reference locations.
39. (Withdrawn) The device of claim 38, wherein each pixel electrode includes first, second, third and fourth pixel electrode reference locations and each common electrode includes first, second, third and fourth common electrode reference locations that correspond to the first, second, third and fourth pixel electrode reference locations and wherein the dielectric protrusions are disposed on the pixel electrodes at second and fourth pixel electrode reference locations and on the common electrodes on first and third reference locations.
40. (Withdrawn) The device of claim 39, wherein the chevron-shaped dielectric protrusion is continuous across the common and pixel electrodes.
41. (Withdrawn) The device of claim 40, wherein the chevron-shaped dielectric protrusion has bends at each intersection with one of the common and pixel electrodes.
42. (Withdrawn) The device of claim 41, wherein the chevron-shaped dielectric protrusion has bends at alternating intersections with the common and pixel electrodes.
43. (Withdrawn) The device of claim 42, wherein the chevron-shaped dielectric protrusion has bends at each intersection with the common and pixel electrodes.

44. (Withdrawn) The device of claim 43, wherein the bends cause the dielectric protrusion to have a zig-zag pattern.

45. (Withdrawn) The device of claim 44, wherein the bends cause the dielectric protrusion to have a zig-zag pattern.

46. (Withdrawn) The device of claim 45, wherein the bends cause the dielectric protrusion to have a zig-zag pattern.

47. (Withdrawn) The device of claim 46, wherein the dielectric protrusions are disposed on the pixel electrodes and the common lines in an alternating pattern.

48. (Withdrawn) The device of claim 47, wherein each pixel electrode includes first, second, third and fourth pixel electrode reference locations and each common electrode includes first, second, third and fourth common electrode reference locations that correspond to the first, second, third and fourth pixel electrode reference locations and wherein the dielectric protrusions are disposed on the pixel electrodes at first and third pixel electrode reference locations and on the common electrodes on second and fourth reference locations.

49. (Withdrawn) The device of claim 48, wherein each pixel electrode includes first, second, third and fourth pixel electrode reference locations and each common electrode includes first, second, third and fourth common electrode reference locations that correspond to the first, second, third and fourth pixel electrode reference locations and wherein the dielectric protrusions are disposed on the pixel electrodes at second and fourth pixel electrode reference locations and on the common electrodes on first and third reference locations.

50. (Withdrawn) The device of claim 49, wherein the chevron-shaped dielectric protrusion is continuous across the common and pixel electrodes.

51. (Withdrawn) The device of claim 50, wherein the chevron-shaped dielectric protrusion has bends at each intersection with one of the common and pixel electrodes.

52. (Withdrawn) The device of claim 51, wherein the chevron-shaped dielectric protrusion has bends at alternating intersections with the common and pixel electrodes.

53. (Withdrawn) The device of claim 52, wherein the chevron-shaped dielectric protrusion has bends at each intersection with the common and pixel electrodes.

54. (Withdrawn) The device of claim 53, wherein the bends cause the dielectric protrusion to have a zig-zag pattern.

55. (Withdrawn) The device of claim 54, wherein the bends cause the dielectric protrusion to have a zig-zag pattern.

56. (Withdrawn) The device of claim 55, wherein the bends cause the dielectric protrusion to have a zig-zag pattern.